

### AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application.

1-87. (Canceled)

88. (Currently Amended) A device for measuring a glucose concentration in a host, the device comprising:

a sensor ~~sensing mechanism~~ operably connected to an electronic circuit and configured to continuously measure a signal associated with a glucose concentration in a host ~~for a period of time~~; and

a membrane located over at least a portion of the sensor ~~sensing mechanism~~, wherein the membrane is configured to control a flux of oxygen and glucose;

wherein the device is capable of exhibiting, at a glucose concentration of 400 mg/dL, no more than a 10% drop in sensor output over a range of pO<sub>2</sub> from about 150 mm Hg down to about 30 mm Hg.

89. (Currently Amended) The device of claim 88, wherein the membrane comprises ~~an enzyme~~ a layer comprising an enzyme.

90. (Previously Presented) The device of claim 88, wherein the membrane is monolithic and homogeneous.

91. (Previously Presented) The device of claim 88, wherein the membrane is monolithic and heterogeneous.

92. (Previously Presented) The device of claim 88, wherein the membrane has a thickness of from about 15 microns to about 60 microns.

93. (Currently Amended) The device of claim 88 94, wherein the useful life of the device is at least ~~period of time is greater than about~~ 3 days.

94. (Currently Amended) The device of claim 88, wherein at least 95% of glucose concentration values measured by the signal device are within 25% of ~~one or more reference values~~ corresponding values determined by analysis of blood over a useful life of the device, ~~and wherein the one or more reference values are determined by analysis of blood.~~

95. (Currently Amended) The device of claim 88, wherein the device is configured to respond substantially linearly to changes in glucose concentration at a glucose concentration of up to about 500 mg/dL ~~or more~~.

96. (Currently Amended) A device for measuring a glucose concentration in a host, the device comprising:

a sensor ~~sensing mechanism~~ operably connected to an electronic circuit and configured to continuously measure a signal associated with a glucose concentration in a host ~~for a period of time~~; and

a membrane located over at least a portion of the sensor ~~sensing mechanism~~, wherein the membrane is configured to control a flux of oxygen and glucose;

wherein at least 95% of glucose concentration values measured by the device ~~signal~~ are within 25% of corresponding values determined by analysis of blood ~~one or more reference values over a useful life of the device, and wherein the one or more reference values are determined by analysis of blood.~~

97. (Currently Amended) The device of claim 96, wherein the membrane comprises ~~an enzyme~~ a layer comprising an enzyme.

98. (Previously Presented) The device of claim 96, wherein the membrane is monolithic and homogeneous.

99. (Previously Presented) The device of claim 96, wherein the membrane is monolithic and heterogeneous.

100. (Previously Presented) The device of claim 96, wherein the membrane has a thickness of from about 15 microns to about 60 microns.

101. (Currently Amended) The device of claim 96, wherein the useful life of the device is at least ~~period of time is greater than about 3 days~~.

102. (Currently Amended) The device of claim 96, wherein the device is capable of exhibiting, at a glucose concentration of ~~about~~ 400 mg/dL, no more than a 10% drop in sensor output over a range of pO<sub>2</sub> from about 150 mm Hg down to about 30 mm Hg.

103. (Currently Amended) The device of claim 96, wherein the device is configured to respond substantially linearly to changes in glucose concentration at a glucose concentration of up to about 500 mg/dL ~~or more~~.

104-112. (Canceled)

113. (Currently Amended) The device of ~~Claim~~ claim 88, wherein the membrane comprises an interference layer.

114. (Canceled)

115. (Currently Amended) The device of ~~Claim~~ claim 96, wherein the membrane comprises an interference layer.

116-133. (Canceled)

134. (New) The device of claim 94, wherein the useful life of the device is at least 1 day.

135. (New) The device of claim 94, wherein the useful life of the device is at least 2 days.

136. (New) The device of claim 94, wherein the useful life of the device is at least 4 days.

137. (New) The device of claim 94, wherein the useful life of the device is at least 5 days.

138. (New) The device of claim 94, wherein the useful life of the device is at least 6 days.

139. (New) The device of claim 94, wherein the useful life of the device is at least 7 days.

140. (New) The device of claim 94, wherein the useful life of the device is at least 10 days.

141. (New) The device of claim 94, wherein the useful life is defined by a period of time after stabilization of the device.

142. (New) The device of claim 141, wherein the useful life is further defined by a period of time during which stability of calibration is maintained.

143. (New) The device of claim 88, wherein the membrane comprises a urethane polymer or polyurethane.

144. (New) The device of claim 143, wherein the urethane polymer or polyurethane comprises a polycarbonate-polyurethane backbone.

145. (New) The device of claim 88, wherein the membrane comprises a cross-linked polymer.

146. (New) The device of claim 88, wherein the device is capable of obtaining a calibration stability that is maintained within 10% for one week.

147. (New) The device of claim 88, wherein the device is configured to respond substantially linearly to changes in glucose concentration at a glucose concentration of up to at least 400 mg/dL.

148. (New) The device of claim 88, wherein the device is capable of attaining a 90% time response to a 100 mg/dL glucose concentration step in less than 5 minutes.

149. (New) The device of claim 88, wherein the device is configured to reduce or eliminate motion artifact.

150. (New) The device of claim 96, wherein the useful life of the device is at least 1 day.

151. (New) The device of claim 96, wherein the useful life of the device is at least 2 days.

152. (New) The device of claim 96, wherein the useful life of the device is at least 4 days.

153. (New) The device of claim 96, wherein the useful life of the device is at least 5 days.

154. (New) The device of claim 96, wherein the useful life of the device is at least 6 days.

155. (New) The device of claim 96, wherein the useful life of the device is at least 7 days.

156. (New) The device of claim 96, wherein the useful life of the device is at least 10 days.

157. (New) The device of claim 96, wherein the useful life is defined by a period of time after stabilization of the device.

158. (New) The device of claim 157, wherein the useful life is further defined by a period of time during which stability of calibration is maintained.

159. (New) The device of claim 96, wherein the useful life is defined by a period of time after stabilization of the device.

160. (New) The device of claim 159, wherein the useful life is further defined by a period of time during which stability of calibration is maintained.

161. (New) The device of claim 96, wherein the membrane comprises a urethane polymer or polyurethane.

162. (New) The device of claim 161, wherein the urethane polymer or polyurethane comprises a polycarbonate-polyurethane backbone.

163. (New) The device of claim 96, wherein the membrane comprises a cross-linked polymer.

164. (New) The device of claim 96, wherein the device is capable of obtaining a calibration stability that is maintained within 10% for one week.

165. (New) The device of claim 96, wherein the device is configured to respond substantially linearly to changes in glucose concentration at a glucose concentration of up to at least 400 mg/dL.

166. (New) The device of claim 96, wherein the device is capable of attaining a 90% time response to a 100 mg/dL glucose concentration step in less than 5 minutes.

167. (New) The device of claim 96, wherein the device is configured to reduce or eliminate motion artifact.

168. (New) A device for measuring a glucose concentration in a host, the device comprising:

an electrode surface operably connected to an electronic circuit and configured to continuously measure *in vivo* a signal associated with a glucose concentration in a host; and

a membrane located over at least a portion of the electrode surface, wherein the membrane is configured to control a flux of oxygen and glucose;

wherein at least 95% of glucose concentration values measured by the device are within 25% of corresponding values determined by analysis of blood over a time period of at least 2 days.

169. (New) The device of claim 168, wherein the time period is at least 3 days.

170. (New) The device of claim 168, wherein the time period is at least 4 days.

171. (New) The device of claim 168, wherein the time period is at least 5 days.

172. (New) The device of claim 168, wherein the time period is at least 6 days.

173. (New) The device of claim 168, wherein the time period is at least 7 days.

174. (New) The device of claim 168, wherein the time period is at least 10 days.

175. (New) The device of claim 168, wherein the membrane comprises a urethane polymer or polyurethane.

176. (New) The device of claim 175, wherein the urethane polymer or polyurethane comprises a polycarbonate-polyurethane backbone.

177. (New) The device of claim 168, wherein the membrane comprises a cross-linked polymer.

178. (New) The device of claim 168, wherein the device is capable of obtaining a calibration stability that is maintained within 10% for one week.

179. (New) The device of claim 168, wherein the device is configured to respond substantially linearly to changes in glucose concentration at a glucose concentration of up to at least 400 mg/dL.

180. (New) The device of claim 168, wherein the device is capable of attaining a 90% time response to a 100 mg/dL glucose concentration step in less than 5 minutes.

181. (New) The device of claim 168, wherein the device is configured to reduce or eliminate motion artifact.